Oct. 3, 1933. J. W. TATTER 1,929,191

OIL TREATING DEVICE

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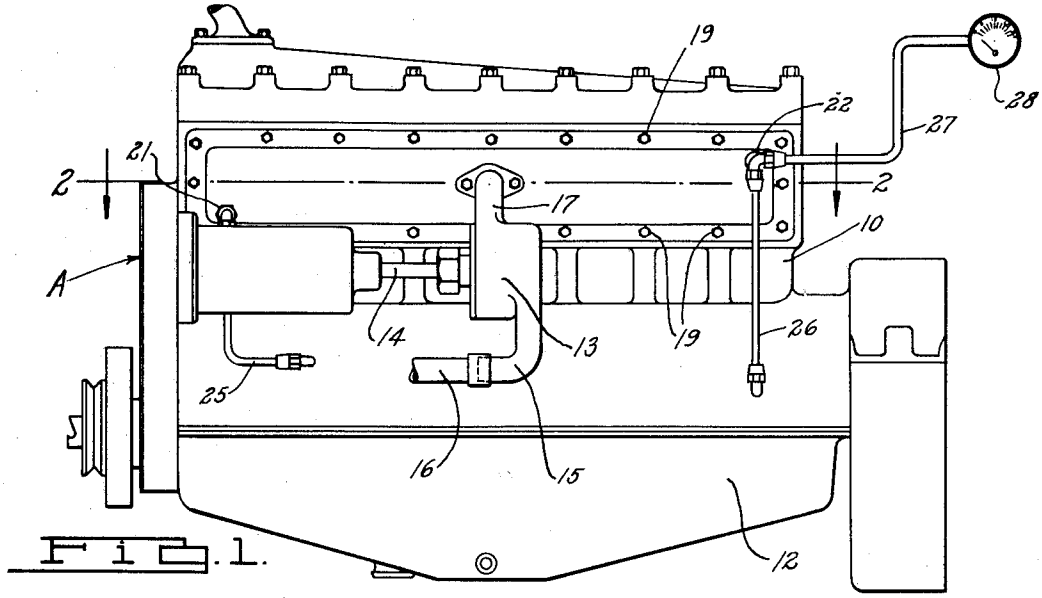


Fig. 1.

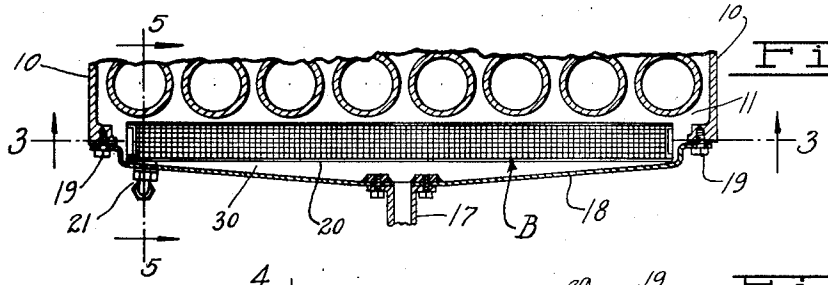


Fig. 2.

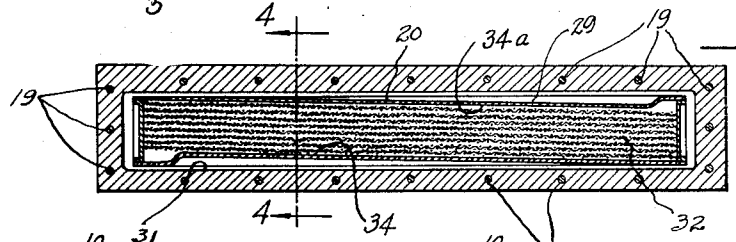


Fig. 3.

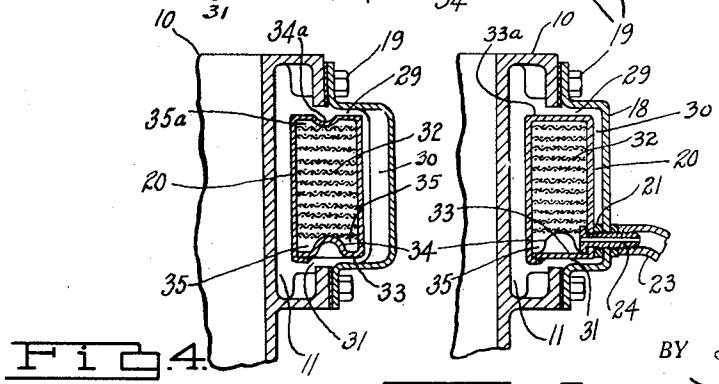


Fig. 4.

Fig. 5.

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OIL TREATING DEVICE

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14 Claims. (Cl. 123—196)

This invention relates to internal combustion engines and more particularly to the treatment of lubricating oil for such engines.

It is an object of my invention to provide improved means for regulating the temperature of the engine lubricating oil. It is known that lubricating oil for engines becomes excessively hot resulting in inferior lubrication and excessive wear of the engine parts as well as a premature thinning and breaking down of the oil. This is especially the case of summer driving conditions.

A further object of my invention resides in improved means for quickly bringing the engine oil up to an efficient temperature on operation of the engine. This is of particular advantage for winter driving conditions as ordinarily the oil viscosity is reduced under low temperatures to the point where it will not flow efficiently until after considerable operation of the engine.

In order to accomplish the objects in view, I have provided a novel oil temperature controlling device adapted for heat exchange relation with the cooling fluid, usually water, in the engine. For convenience I have provided a novel construction readily adaptable to engines now in general use by mounting the oil treating device with a water jacket or other cover of the engine.

It is a further object of my invention to provide means for filtering the oil to remove impurities, including solid particles of foreign matter from the oil during the heat exchanging action. Thus, in one accessory, I have provided an oil temperature regulating and filtering device.

Further objects of my invention will be apparent from the following description of one embodiment of my invention as illustrated in the drawing in which:

Figure 1 is an elevation view of a typical engine with my device attached thereto,

Figure 2 is a detail sectional view along the line 2—2 of Figure 1 showing my device in section,

Figure 3 is a vertical sectional view through my device along the line 3—3 of Figure 2,

Figure 4 is a sectional view along the line 4—4 of Figure 3, and

Figure 5 is a sectional view along the line 5—5 of Figure 2.

In the drawing reference character A represents an internal combustion engine of generally conventional design having cylinder block 10 providing the usual water jacket structure 11 and crankcase structure 12. The engine illustrated has a water pump 13 driven from accessory shaft 14 for pumping cooling water from inlet 15, connected as usual by pipe 16 with the outlet of the radiator (not shown), to outlet 17 opening into the jacket structure 11 as shown in Figure 2.

A jacket cover plate 18 is removably secured at 19 to the cylinder block 10. My oil temperature regulating device B comprises a relatively long casing 20 suitably sealed against entrance of water thereinto and preferably carried by plate 18 by reason of the oil inlet and outlet coupling supports 21 and 22 respectively. Referring to Figure 5, I have illustrated one way in which these couplings may be formed and in which the inner end of oil pipe 23 threadedly engages a clamping conduit 24 whereby casing 20 may be firmly removably clamped with cover 18.

The oil inlet 21 communicates through oil pump 23 and conduit 25 with the usual oil supply in the crankcase 12 having the usual pump (not shown) for placing the oil throughout the oiling system including conduit 25 and device B under the desired pressure. From the device B the oil passes therefrom by reason of the outlet 22 and through conduit 26 to the usual engine bearings, surfaces and other parts usually lubricated (not shown). It is also usually desirable to provide a conduit 27 between the oil gage 28 and conduit 26 to indicate the pressure of the oil being supplied to the engine.

The casing B is suitably constructed to provide for heat exchange relationship with the cooling water in the engine and I do not regard it necessary in order to obtain efficient results to provide fins or the like especially with the liberal cooling surface possible by reason of my device. Preferably the cooling water in jacket 11 surrounds the device B and for efficient cooling I have illustrated the device B adjacent the water inlet 17 since the incoming water is relatively cool. It will be noted that the casing 20 provides for distributing the water to the various cylinder jacketing portions, the casing having a baffling effect permitting the water to circulate through spaces 29, 30 and 31 exteriorly of casing 20.

Within casing 20 I preferably provide means for suitably cleaning or filtering the oil. To this end a plurality of fine mesh screening forming a filter unit 32 is provided whereby the oil is filtered as it passes upwardly from the casing bottom. One manner of arranging the screening is to provide relatively coarse screening at the bottom of the filter unit 32 and relatively finer screening toward the top. I also have provided the casing lower wall 33 with a deflected tapering rib 34 forming a seat for the unit 32 whereby the unit 32 is spaced from the lower wall 33 to form oil channels 35. The incoming oil from conduit 23 is distributed along channels 35 and thence passes upwardly through the filtering unit to outlet channels 35^a formed similarly to channels 35 by reason of the tapering rib 34^a formed in the upper wall 33^a. The tapering ribs 34 and 34^a

provide for efficient distribution of the oil relative to the inlet and outlet.

By reason of my invention the oil in passing from the crankcase to the engine is first treated by the device B. For summer driving the device B serves to cool the oil by reason of the heat exchange relation with the jacket cooling water. For winter driving and in starting the engine, the oil temperature is quickly raised to substantially the water temperature. In many automotive vehicles the cooling water is controlled as to its temperature by thermostatic circulation control or radiator shutters whereby the cooling water is quickly brought up to efficient temperature. My invention provides an improved means for maintaining the oil at substantially uniform temperature, the engine and oil under such conditions lasting longer, providing improved lubricating action in general, minimizing oil consumption and enabling the oil to be used longer than customary.

Instead of utilizing the water jacket cover 18 and the opening associated therewith to receive by device B, such device in its illustrated form or otherwise constructed in accordance with my invention might be located at other points in the engine and I do not limit my invention in its broader aspects to the embodiment illustrated.

What I claim as my invention is:

1. In a water jacketed internal combustion engine having a removable water jacket cover, an oil filter carried by said cover and housed within the engine water jacket.

2. In an internal combustion engine having a removable water jacket cover, an oil cooler and filter internally carried by said cover.

3. In an internal combustion engine having a water jacket provided with a water inlet opening, a cover for said opening, an oil treating device carried by said cover and supported within said opening for effecting a predetermined distribution of the cooling water.

4. An oil cooler and filter comprising a casing adapted for heat exchange contact with a cooling medium, an oil filtering medium within the casing, an oil inlet for the casing at one end thereof, an oil outlet for the casing at the opposite end thereof, and means within said casing providing an oil chamber between the casing and filtering medium, said chamber progressively varying in cross-sectional area.

5. An oil cooler and filter comprising a casing adapted for heat exchange contact with a cooling medium, an oil filtering medium within the casing, an oil inlet for the casing substantially at the bottom of one end thereof, an oil outlet for the casing substantially at the top of one end thereof opposite from the end aforesaid.

6. An oil cooler and filter comprising a casing adapted for heat exchange contact with a cooling medium, an oil filtering medium within the casing, an oil inlet for the casing substantially at the bottom of one end thereof, an oil outlet for the casing substantially at the top of one end thereof opposite from the end aforesaid, and means within the casing and along the bottom thereof providing an oil chamber between the casing and filtering medium, said chamber having progressively varying cross-sectional areas.

7. An oil cooler and filter comprising a casing adapted for heat exchange contact with a cooling medium, an oil filtering medium within the casing, an oil inlet for the casing substantially at the bottom of one end thereof, an oil outlet for the casing substantially at the top of one end thereof opposite from the end aforesaid, and means within the casing and along the bottom thereof providing an oil chamber progressively varying in cross-sectional area longitudinally of the casing between the casing and filtering medium, and means within the casing and along the top thereof providing an oil chamber progressively varying in cross-sectional area longitudinally of the casing between the casing and filtering medium.

8. In an engine structure having a jacket portion through which a cooling medium may be circulated and having an opening in the external wall thereof, a cover for said opening, and an oil cooling and filtering device substantially filling said opening and secured to the inner face of said cover.

9. In an engine structure having a jacket portion through which a cooling medium may be circulated and extending longitudinally of the engine, said jacket portion having an inlet opening extending substantially the length thereof longitudinally of said engine, and an oil cooling and filtering device within said jacket portion and positioned longitudinally thereof adjacent said inlet opening.

10. In an engine structure having a jacket portion through which a cooling medium may be circulated and extending longitudinally of the engine, said jacket portion having an inlet opening extending substantially the length thereof longitudinally of said engine, a cover for said opening, and an oil cooling and filtering device secured internally of said cover and positioned longitudinally within the jacket portion adjacent the inlet opening.

11. In an engine structure having a jacket portion extending longitudinally of the engine through which a cooling medium may be circulated, said jacket portion having an inlet opening, and a combined oil cooling and filtering device supported within said jacket portion adjacent to said opening and constructed to baffle the incoming cooling medium to effect a predetermined distribution of said cooling medium.

12. In an engine structure having a jacket portion extending longitudinally of the engine through which a cooling medium may be circulated, said jacket portion having an inlet opening, a casing within said jacket portion and constructed for heat exchange contact with the cooling medium, said casing provided with an oil inlet and outlet and having an oil filtering device housed therein, a cover for the inlet opening of said jacket portion and provided with an inlet, said casing secured internally of said cover intermediate the cover inlet and jacket portion and constructed for cooperative operation with the cover inlet for effecting a predetermined distribution of the cooling medium.

13. In an internal combustion engine including a water jacketed engine block, an oil treating device including a filter for the engine lubricating oil, said engine block jacket having a water inlet opening, and a cover for said opening, said device supported by said cover within the engine block jacket.

14. In an internal combustion engine including a water jacketed engine block having a water inlet opening, a cover for said opening, and a filter for the engine lubricating oil supported by said cover within the engine block jacket.

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